

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently amended) A method for marine seismic data acquisition, comprising:

obtaining a 3D wavefield by cross-line acquisition using one or more marine seismic sources and a plurality of marine seismic receivers arranged into one or more lines, wherein:

the one or more marine seismic sources are towed behind a seismic vessel in an essentially orthogonal direction relative to the one or more lines of the marine seismic receivers; and

the one or more marine seismic source are fired at intervals as the one or more mariner seismic sources are towed orthogonally with respect to the one or more lines of the marine seismic receivers; and

an offset between shooting locations of the one or more seismic sources is regarded as an equal shift of the line of seismic receivers; and

decomposing the obtained seismic wavefield by applying a decomposition filter having two spatial directions to obtain a decomposed wavefield, wherein the decomposition filter is applied as a cascaded filter.

2. (Previously presented) The method of claim 1 wherein the decomposition is for at least one of a group consisting of up- or down going decomposition , P/S decomposition, elastic decomposition and acoustic decomposition.

3. (Previously presented) The method of claim 1 wherein the filter comprises in-line component (k_x) and cross-line component (k_y) or a spatial representation of the in-line component (k_x) and cross-line component (k_y).

4. (Canceled)

5. (Original) The method of claim 1 wherein the filter is a compact filter.

6. (Original) The method of claim 1 wherein the filter filters an obtained pressure wavefield.

7. (Original) The method of claim 1 wherein the filter exclusively filters an obtained pressure wavefield.

8. (Original) The method of claim 1 wherein the step of applying the filter is preceded by a calibration step to match geophone recordings with hydrophone recordings.

9. (Original) The method of claim 1 wherein the step of applying the filter is followed by a step of removing multiples from a component of the decomposed wavefield.

10. (Previously presented) The method of claim 1 wherein the step of applying the filter is followed by a step of imaging or migrating the filtered wavefield to generate an image of subterranean formations.

11. (Original) The method of claim 1 wherein the wavefield is obtained through receivers located on the sea floor.

12. (Original) The method of claim 1 wherein the wavefield is obtained through receivers towed by a vessel.